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ABSTRACT

Research analyzing users' reactions to the implementation of automation and computer technology in the industrial and business fields indicates that users will respond more positively to these new technologies if they are adequately trained beforehand. To measure response in the academic sector, users' reactions to the local area network (LAN) in the library school at the University of North Texas were surveyed. The instrument was distributed to 17 faculty and staff members (with a response rate of 65%) and to 20 students enrolled in a class on automation (6 students returned the survey in time to be counted). The survey instrument sought general information about the survey participants; their involvement in the initial planning of the LAN (a majority of the faculty and staff were initially involved in the project); and frequency of LAN use. It also sought to determine whether there was adequate staffing of LAN, and if the LAN programs were meeting user needs and increasing their productivity, and requested suggestions for future use. It was learned that, while participants initially experienced feelings of apprehension and confusion, their overall responses were positive. A majority of the respondents indicated that they would devote more resources to the LAN; however, the participants expressed desires for more LAN accessibility, an in-house user manual, greater technical staff availability to solve user problems, and less down time. Two graphs demonstrate LAN usage from the time of its initial start-up, and a chart records the names of the LAN's most frequent users and the time they spent on LAN. (9 references) (MAB)

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A SURVEY OF USERS' REACTIONS TO THE LOCAL AREA NETWORK IN THE LIBRARY SCHOOL AT THE UNIVERSITY OF NORTH TEXAS

A Research Study

U.S. DEPARTMENT OF EDUCATION
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by

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INTRODUCTION

It is communication that makes human society possible. Indeed, we may view our society, or family, our neighborhood or government agencies, or lodges and clubs, or state and nations or our own individual relationships with those around us as communication networks (1:28-29). The basic fact about organization is communication. In Norbert Weiner's The Human Use of Human Beings, in which he suggests that a society can be understood only through a study of messages and the communication facilities in its structure.

This study is an effort to determine the users reactions to the LAN in the workplace. The study will also provide an evaluative review of the LAN in its infancy. The opinions, reactions and suggestions for change obtained from this study will be useful for future planning.

Hopefully, the data collected, analyzed and formulated into a report will serve as an in-house document for future evaluation, documentation for study committees, and possibly a step in planning staff development programs for the faculty and staff of the University of North Texas Library School.

THE LITERATURE SEARCH

The introduction of computer technology have important practical implications for managing an organization. The computer has the potential of being both a friend and a foe at the same time. What will make the difference is our ability to deal with inherent human and social issues posed by computer technology (2:13).

As organizations try to improve efficiency, become more productive, or pursue the elusive goal of excellence, most have focused on simplifying the work performed by the individual. This was especially true of the industrial revolution. Advances in steam engine technology meant that human beings did not have to provide the basic physical power to perform this work. Instead engines performed the dangerous and backbreaking aspects of the job. Next, scientific management techniques, such as time study and industrial engineering allowed firms to simplify tasks further and have machinery perform many of the repetitive tasks (2:6).

The literature identified several studies that focused on users reactions to automation technology and especially computers in the work environment. One industrial survey conducted in Dallas, Texas, in November, 1981, involved the Dallas Chapter of the Data Processing Management

Association. The respondents were asked to rate their own personal attitudes toward the use of microcomputers in their own organizations. The rating was done on a scale of extending from 1 (meaning "enthusiastic" endorsement) to 5 (meaning "do not see any need for microcomputers"). About 80.6 per cent of the large organization users having micros rated themselves as either enthusiastic (41.8 per cent) or positive (38.8 per cent). Clearly, to know a micro is to respect it (3:143-144).

Madron, the author of the survey, stated that it appeared that the maximum value is being extracted from the microcomputers on hand. He stated that this along with the slowness in implementing networking results from a clearly evident lack of planning. Without appropriate planning--with imagination, intuition, and foresight--not only microcomputers, but other technologies designed to improve the workplace will not be implemented well.

Another study dealing with industry investigated the degree of perceived stress reported by information systems personnel and compared them with other professionals. The study included 580 participants from 18 major United States companies. According to the results, information systems personnel showed no higher perceived stress than professionals in other occupations. In addition, job satisfaction levels were similar for all groups. This study supports the

findings of the others; that professionals using computer technology do not feel as much stress as nonprofessionals because they feel that they have more control over how to conduct their jobs.

The study also suggest that the content of the job may be more significant than the technology or tools of the job. Where the two aspects are related is when the technology reduces the amount of control experienced by the worker and thus increases the likelihood of stress (2:21).

Manuel London and John Paul MacDuffie reported in Personnel in the November, 1987, issue two cases of examining technological innovations in the workplace. The first case involved the internal telecommunications group of a large nationwide organization designing and implementing a system for desk-to-desk electronic mail, word processing, filing and announcements. The second case involved the introduction of a sophisticated computer technology into the central office of a large company that allowed the monitoring of electronic telecommunications switching equipment in remote locations (4:26).

The authors stated that the cases that they examined provide lessons for managers planning to introduce technological changes. The central monitoring center case showed the danger of imposing a major change on employees without their approval and involvement. It taught managers to

anticipate employee resistance to changes that threaten to alter the number of people needed, their qualifications, and their relationship with each other (4:36).

The electronic message center case showed the benefits of flexible technology. Electronic messages were used in different ways by different managers. Some made it the principle mode of communication, whereas others used it sporadically or not at all (4:36).

When organizations neglect to consider the impact new technologies can have on employees, they may find that the benefits of increased productivity and lowered operating costs are slow in coming. Employess may resist change, and morale may deteriorate rapidly. The following case history of an engineering company that decided to implement office automation technology illustrates how the introduction of a technological system can backfire if human resources factors are not considered (5:32).

Top management of the engineering company was contacted by representatives of an office automation company. The representatives explained how the system could increase secretarial productivity by decreasing typing and filing time, thereby giving secretaries more time for administrative duties. Top management decided to purchase a system immediately--without first conducting a thorough systems analysis of the company. Moreover, management failed to consider the

needs and attitudes of the secretaries.

As a results of a lack of skills and experiences with the new system, morale and job-satisfaction levels decreased, pay and job grade did not increase, and many secretaries were considering leaving the company to search for jobs elsewhere. The authors pointed out three common mistakes by management: (1) management did not plan effectively for the introduction of the new system, (2) management assumed that secretaries could immediately handle more work and increase productivity, (3) management provided inadequate compensation for secretaries new skills and failed to consider the career-related aspects.

Since this study will deal with the reactions of users to the Local Area Network, the literature revealed several articles expressing the users rating of the Local Area Network in the workplace.

Bridget O'Connor and Michael Bronner surveyed Local Area Network (LAN) users to determine if the LAN is living up to expectations. Members of the New York Chapter of the Association for Systems Management (ASM) and members of the Office Systems Research Association (OSRA) were sent questionnaires that assessed their use of LAN with force choice items in additions to a 21-item Likert scale to ascertain the success of the LAN. The researchers selected 15 respondents for telephone interviews on human factor issues

related to the study (6:6).

The results concluded that the LANs were perceived as successful and LAN technology can do what it claims to do. The request for LAN technology initiated from microcomputer users in 28 per cent of the cases suggests that end users appear to have a relatively large impact on the decision to network. LAN managers whose responses constituted the data for this investigation represent a wide spectrum of business, industrial, and educational environments.

Datapro Research Corporation surveyed LAN users for the third year in January, 1988. Four hundred forty-seven (447) LAN users completed and returned surveys. All of the users were Data Communications subscribers who were identified as domestic users of data communications equipment (6:9).

The results of this survey indicated that the majority of the local area networks now in operation continue to be coaxial cable-based and are used in an office environment. The users who responded to the survey expressed satisfaction with the LAN and a majority would recommend their LAN to other users (6:129).

In the studies mentioned above the focus has been on users' reactions to automation and computer technology in industrial and business fields. However, users' reaction to

technological advancement is evident in the academic arena. A study done at the New York University Library, Bobst Microform Center, led by Donald C. Holmes, had very interesting results. Microforms can be accepted without user or librarian resistance if planning is directed toward the environment. This study revealed that it is not so much the microforms, but machines needed to read them, and the methods used to locate them. Where libraries are already built and no plans for microform areas were taken into consideration, most problems discovered during this research will most likely occur. The authors of the article concluded that by changing (sprucing up) the environment contributed to changing users attitudes from negative to positive regarding format (7:2139).

The Pennsylvania State University's Ogontz Campus Library administered a questionnaire to users of INFOTRAC between March 17 and May 1, 1988, to gauge the users reactions and examine the suitability of continuing the Information Access Company's Academic Index. InfoTrac is an automated reference system which allows retrieval of bibliographic records stored on a compact disk.

After tallying the responses on the questionnaire, the library found the results and observation to be resoundingly positive. The majority of the users strongly agreed that InfoTrac can be used without formal training. Sixty-three

percent felt that they successfully answered their questions using InfoTrac. On the downside, there were the usual problems likely to be encountered with computer equipment. The printer jammed periodically but was easily fixed by realigning the paper. The major advantage was that student accepted the system and seemed to enjoy using it (8:14-16).

Joyce M. Copeland and Stephen Ford describes some of the findings of a research project that investigated the applications of Local Area Networks (LANs) in special libraries and information units. The paper focused on making users aware of pitfall and pointed out opportunities in using the Local Area Network in a Library environment (9:273).

There are many articles in the literature on the applications of technology in the workplace and the users reaction to technology. Hoswver, this study will focus on users' reaction to a local area network that was recently introduced into the work environment of a library school.

A SURVEY OF USERS' REACTIONS TO THE LOCAL AREA NETWORK IN THE LIBRARY SCHOOL AT THE UNIVERSITY OF NORTH TEXAS

Kevin Mullet in as article entitled "LAN of the Free, Home of the Brave" that was published in the March, 1989 issue of Benchmarks, defines a Local Area Network (LAN) as a group of computers in a single work area, such as an office or a lab, that have been connected together to provide easy access to common storage, printers, and each other. A group of computers in a lab might all share a common disk drive on a LAN. Each student in that lab could use any of the software stored on the disk drive. Each computer in an office could be connected through a LAN to a high quality laser printer. These computers could also share software stored on a file server.

In the fall of 1988, a local area network was installed in the library school at University of North Texas. In the spring of 1988, I submitted a proposal to study the initial reactions of the LAN by the faculty, staff and a select number of students. The student participants are a part of a automation class that has been assigned the use of the LAN as a part of a course requirement. A survey was circulated to seventeen members of the faculty and staff and twenty students. Six faculty and staff failed to respond for a return rate of 65% and fourteen students failed to repond for a 30% return rate. The students low responses

could be attributed to the completion of an assignment. As students completed the assignment on the LAN, they completed the surveys. However, only six met the deadline for returning the survey by April 15, 1989.

THE RESEARCH INSTRUMENT

The preliminary draft of the survey instrument was circulated among LAN users on the campus of the University of North Texas. A letter which accompanied the preliminary draft stated the purpose of the study, the anticipated results of the study, and sought input into the design of the final draft of the instrument.

The responses received from the preliminary draft were very beneficial and relevant to the final draft. Questions One and Two of the final draft sought to obtain general information about the survey participants. Questions Four through Nine were designed to solicity responses from participants about their initial involvement in the planning and development of the Local Area Network or were other alternatives to the LAN considered. Questions Ten through Fifteen attempted to determine the actual use of the LAN and the frequency of use. Questions Sixteen sought to determine if staffing of the LAN was sufficient for the needs of the users. Question seventeen and Eighteen attempted to determine if the programs on the LAN are meeting the needs of the users and increasing their productivity. Questions Nineteen

and Twenty sought to determine the experiences in using a computer system and any future use.

Questions Twenty-one through Twenty-four were designed to be answered by the faculty. The questions tried to focus on professional development by using the LAN and yet, soliciting some suggestions for future use.

DATA ANALYSIS

"Faculty and Staff Responses"

Of the eleven (11) faculty and staff members responding, only seven stated how long they had been employed by the library school. There were two employed at least one year; three (3) 2-5 years; one (1) 5-10 years and one (1) over ten. In question three (3) fifty percent stated that they found out about the LAN from the LAN manager. One (1) from a student; two (2) from another staff member and one (1) from the Dean.

When asked about the initial reaction to the LAN 81 percent stated that they were interested; only one (1) was apprehensive, one (1) overwhelmed and one (1) disgusted. In question five (5) only three (3) persons responded--one (1) stated that they had reservations about the LAN because of a lack of technical skills; one (1) because it was an added workload; one (1) because it was too confusing trying to get into the system each day.

Seventy-three percent of the responses stated that they had been formally introduced to the LAN Project. About 20 percent stated that they had not been formally introduced. Fifty-five percent stated that they had input into the planning of the LAN, 20 percent stated that they did not have input and they did not desire to have input. Twenty percent

had no opinion. Question eight resulted with 100 percent stating if they had a choice, they would devote SLIS resources to the LAN. However, on question nine, 80 percent stated that cost was not a factor in the initial perception of the LAN and twenty percent stated that cost was a factor.

When quering the participants about what they like most about the LAN, the majority stated access to software programs in their office setting and the shared files features. Down time and bugs were the things they liked least about the LAN. Seventy percent of the respondents stated that they had problems using the LAN. Thirty percent said they did not have any problems. Some of the problems listed were not enough training, print problems and finding way through paths.

Respondents listed changes they would like to see in the LAN:

1. More hours of the LAN being up.
2. Hire a technician.
3. Hire additional support staff.
4. The ability to access student files.
5. Provide adequate documentation.
6. Have Word-perfect 5 on hard drive especially when network is down.

Fifty percent of the respondents stated that they used the LAN daily; 30 percent weekly; 10 percent, monthly and 10 percent, never. When asked what they used the LAN for, the majority listed wordprocessing. Fifty-seven percent thought the LAN was appropriately staffed. Forty-three per

cent stated additional staff is needed. One respondent stated that the LAN manager should not have other full time responsibilities.

Sixty percent of the responses stated that the LAN has made their work tasks easier. Forty percent stated that their work task was not any easier because of the LAN. Ninety percent stated that the software programs are appropriate to their needs, 10 percent felt they were not. The majority of the respondents have had experiences with other computer systems. Eighty percent of the respondents stated an interest in networking with other LANs on campus. Twenty percent are not interested.

Several general questions were asked to input for future planning. The question was asked: who proof the draft of your publications? Several responded that someone should have that responsibility. Several responses were given for, "If a modem is added to your office computer, what would you use it for?" Communication with off-campus sources, access to library databases, and W/P notebooks. Statistical packages, tutorials, desktop publishing and wordperfect were software programs they are interested in learning. The last question had to do with communication with colleagues because of different office and teaching schedules. Fifty percent said yes and fifty percent said no to problems communicating with colleagues.

"Student Responses"

The students were introduced to the LAN by their professor Dr. Norman Howden. Of the six responding, four were interested in the LAN, one was apprehensive, and one did not respond. Three had reservations about the LAN because of a lack of technical skill, one thought it was an added workload and two did not respond to that question. ONly one student stated any input into the LAN, two said they did not and did not desire to and two had no opinion.

All respondents stated that they would devote resources to the LAN if they had to. Only two answered if cost was a factor in their perception of the LAN and the two said no. The students listed assessing many software programs is the thing they like best about the LAN and the lack of experience in using the LAN as the thing they like least. Fifty percent of the students stated that they had problems using the LAN. Their problem was getting on and off the LAN.

The students listed changes they would like to see in the LAN:

1. All lab computers should be accessible to the LAN.
2. Full menus.
3. Information about the LAN should be in the Lab manual.

Students used the LAN weekly to work on class assignments. They used the LAN for wordprocessing and electronic mail. Two out of the three students answering the question,

"is LAN appropriately staff?" said yes. One student said no and a student LAN manager should be hired.

Of the two students answering, "have your work task been made easier by the LAN?, one said yes, one said no. Five students, or 80 percent stated that software programs are appropriate to their needs. All the respondents had used other computer systems before. Fifty percent of the students stated they had an interest in networking with other LANs on campus.

The following graphs demonstrate LAN usage from the initial start-up in November 21, 1988, through April 23, 1989. Graph One indicates 13.9 percent use in November, heavy use in December with 51.9 percent, in January and February usage decreased to 10.9 percent in March and April.

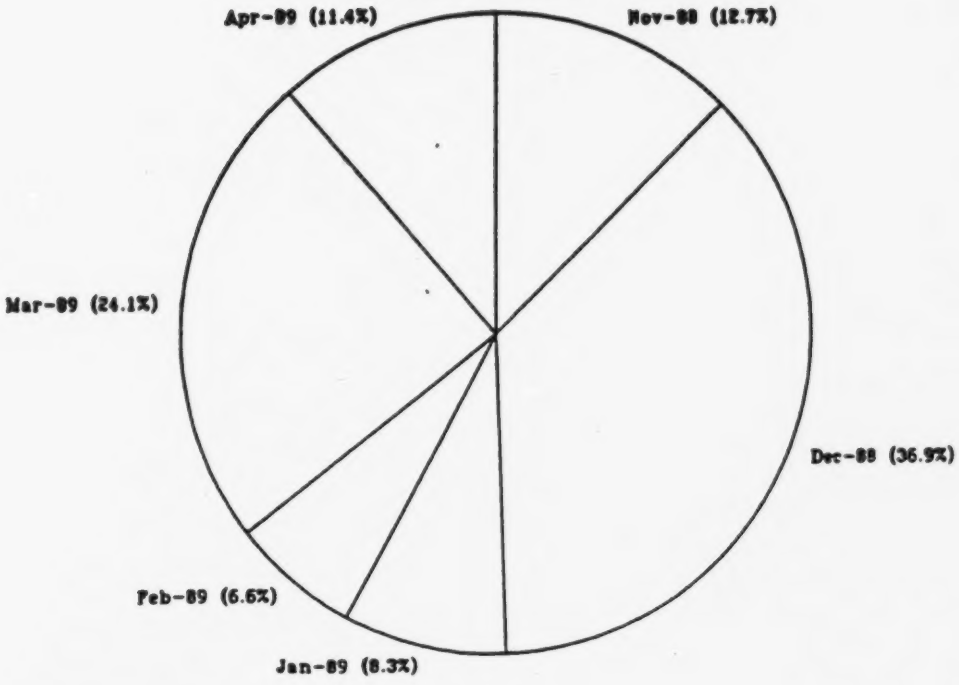
Graph Two indicates minutes used in percentage. In November, an average of 12.7 percent of minutes were used. In December, an average of 36.9 percent minutes were used, in January, an average of 8.3 percent minutes were used; in February, 6.6 percent of minutes were used; in March 24.1 percent of minutes were used; and in April, 11.4 percent minutes were used on the LAN.

The following chart indicates the frequent users and the amount of time each user spent on the LAN in the library school and the percentage of usage.

Name	Number of Minutes	Percentages
Howden	39,405	23.5%
Paula	25,107	15.0%
Cathy	21,368	12.7%
Office	14,386	8.6%
Stein	11,608	6.9%
Supervisor	9,591	5.7%
CS-ROM	8,769	5.2%
Woozle	6,858	4.1%
Christianso	5,667	3.4%
Library	5,124	3.1%
Lisa	4,905	2.9%
LAN Boss	2,976	1.8%
Pierce	2,472	1.5%
Stuiveng	2,423	1.4%
All others	7,077	4.2%

LAN Use – Minutes Used

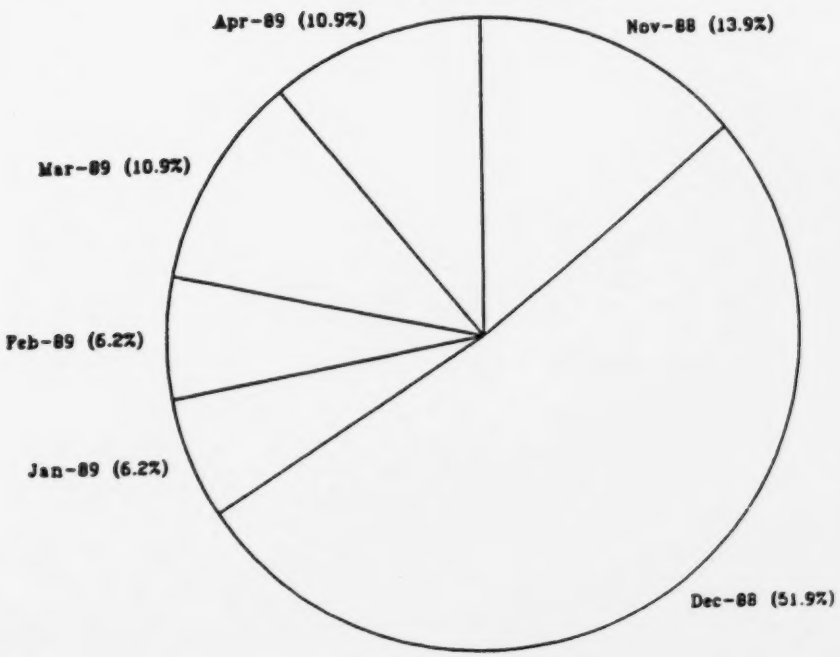
21 Nov 88 - 23 Apr 89



GRAPH I

LAN Use – Logon Sessions

21 Nov 88 - 23 Apr 89



GRAPH II

CONCLUSION

This study attempted to examine how users of the Local Area Network reacted to additional technology in the library school. The implications from my perspective was--is it a burden or a blessing. The responses from the survey seems to indicate that reception to the LAN is very good. The staff appears to use the LAN on a regular basis when the faculty seems to say, I think it is a great piece of technology, and as soon as I get a chance I will use it more frequently.

The largest problem with the LAN that was revealed by the survey is the lack of training in the use of the LAN, a lack of an in-house user manual, insufficient technical staff when problems arise, and too much down time.

As the LAN program continues to develop many of these problems will be solved. As the LAN technology continues to develop and interest increase in the need to use the technology, the University of North Texas Library school will be a forerunner in the advances of the technology.

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